

POLYCHRYZIA MORIGERA (NOCTUIDAE) TRAPPED IN A SOUTHERN
LADY'S-SLIPPER LABELLUM IN TENNESSEE

Catling (1974, Newsletter Mich. Entomol. Soc. 19(1):1, 3) conjectured that a skipper butterfly, *Thymelicus lineola*, might exemplify a case in which a species recently introduced into North America had not "learned" that entering labella of the showy (or queen) lady's-slipper flowers was both unproductive of nectar and likely to result in entrapment. The discovery described below extends his hypothesis to the southern lady's-slipper, *Cypripedium kentuckiense* Reed, and a plusiine noctuid moth, *Polychrysia morigera* (Edwards). The moth is a western American species which seems to have recently become established in the East.

On 24 May 1984, Medley discovered two moths inside the shoelike labellum of one flower of the southern lady's-slipper in Scott Co., Tennessee. The plant was located at the margin of a mesic floodplain forest, and was growing in a more open area than were most of the others in that population. One moth was dead, the other still alive; both were slightly worn, probably from their efforts to escape. This was the first discovery of a lepidopteran in flowers of this species during a study of lady's-slippers populations in which over 1,000 blossoms were examined in Kentucky, Tennessee, Arkansas, and Oklahoma from 1980-85. That number includes about 200 at the Scott Co. site examined at the time the moths were recovered. The only other insect found in the overall survey was a single large bee (*Xylocopa* sp.?) in a labellum in Jefferson Co., Arkansas.

Covell identified the moths as male *Polychrysia morigera*, a species previously restricted to far western states (Eichlin & Cunningham 1978, U.S. Dep. Agr. Tech. Bull. 1567, 122 pp.). However, it appeared in Kentucky in 1976 (Covell determination), and is now known from five Kentucky counties, collected from 20 May to 13 June. The only other known eastern record is a recent capture in Pennsylvania (J. G. Franclemont, pers. comm.). It is unknown from Missouri, which has been extensively surveyed for Lepidoptera (J. R. Heitzman, pers. comm.). The present record constitutes the first report of moths in southern lady's-slipper flowers, and also the first Tennessee record of *P. morigera*.

Trapping of Lepidoptera by flowers of other *Cypripedium* species has previously been reported (Arthur 1962, Proc. Entomol. Soc. Ont. 92:190-191; Stoutamire 1967, Mich. Bot. 6:159-175; Catling, cited above; Barrows 1983, J. Lepid. Soc. 37:265-267). Small bees rather than Lepidoptera appear to be pollinators of *Cypripedium* species (Stoutamire, cited above). Catling explained how no nectar is produced by the flowers, but odor and color attract bees into the lip. They then exit through small openings placed so as to force the bees to rub against pistil and anthers. These openings are too small to permit escape by butterflies. Based on a literature review, Stoutamire summarized insect relations with five *Cypripedium* species. None involved *C. kentuckiense*. The only moth record was for *Tetraxis cachexiata* Guenée (Geometridae; published as *T. lorata* Grote, a synonym), reported by J. Newman to be resting on the labellum of a stemless lady's-slipper, *Cypripedium acaule* Ait., in Michigan. The only butterflies observed inside labella of any species were recorded in those of showy lady's-slipper, *C. reginae* (Walt.). These were the following skippers (Hesperiidae): *Thymelicus lineola* (Ochsenheimer), *Epargyreus clarus* (Cramer), *Polites mystic* (Edwards), and *Polites themistocles* (Latreille). Arthur (cited above) found six individuals of the European skipper, *Thymelicus lineola*, in labella of *C. reginae* in Ontario. Catling found the same skipper in "at least half" of the "about 100" flowers of showy lady's-slipper that he examined in July 1971, in Grey and Simcoe counties, Ontario. Some blossoms contained as many as five butterflies each, some alive, some dead. In early June 1972, Catling and colleagues found one flower containing a European skipper in Washtenaw Co., Michigan. Catling noted that other skipper species of similar size were more abundant in these habitats than *T. lineola*, but none found in flowers. Barrows (cited above) found up to 24 *T. lineola* in a single *C. reginae* labellum in Cheboygan Co., Michigan. He recovered 646 *T. lineola*, as well as other insects, including "geometrid moths" from an undisclosed number of blossoms examined. *Thymelicus lineola* and unidentified geometrids were also found in *C. cal-*

ceolus L., which we determined from a Barrows illustration to be the taxon now considered *Cypripedium parviflorum* Salisb. Barrow's 1978 samples consisted of 73–90% males.

Catling conjectured that because *T. lineola* had recently been introduced into North America from Europe (1910), it might not have undergone microevolution enabling it to avoid entering and becoming fatally trapped in lady's-slipper flowers. The hypothesis is plausible in light of the many trapped *T. lineola* he and Barrows reported, contrasting with a lack of common "native" skippers trapped in labella. In support of Catling's hypothesis, we suggest that *P. morigera* may also have become established in eastern North America recently, and might also be unfamiliar with the dangers of entering these flowers—a case parallel to that of the European skipper farther north.

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CHARLES V. COVELL, JR. AND MAX E. MEDLEY, *Department of Biology, University of Louisville, Louisville, Kentucky 40292.*

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AVIAN PREDATION OF ALPINE BUTTERFLIES

Because direct observation of predation on butterflies is exceedingly rare (Bowers et al. 1985, *Evolution* 39:93–103), the following observations of avian predation on a variety of alpine butterflies may be of interest.

While studying the foraging ecology of nesting water pipits (*Anthus spinoletta* (L.)) on the Beartooth Plateau (elev. 3,300 m), Park Co., Wyoming, I observed a nesting female pipit capture and consume the following butterflies from 6–10 August 1983, all between 1721 and 1935 MDT: two *Speyeria mormonia* (Boisduval), one *Parnassius phoebus* Fabricius, and one *Euphydryas editha* (Boisduval). In each case the butterfly was flushed from the ground as the pipit foraged by walking through the tundra vegetation. The wings were torn or flicked off before the body was eaten.

That one bird was seen capturing and eating four butterflies in a relatively short time (10 h of observation) suggests that avian predation could at times cause important mortality in some alpine butterfly populations. The proposed impact of avian predation on alpine butterflies would probably not be as extreme as that documented for other, low elevation, butterflies (Calvert et al. 1979, *Science* 204:847–851; Fink et al. 1983, *Biotropica* 15:151–153; Bowers et al. 1985, *Evolution* 39:93–103). However, it might still be a significant factor in the demographics of narrowly distributed taxa, such as *Boloria acrocynema* Gall & Sperling (Gall 1984, *Biol. Conserv.* 28:111–138), especially if the breeding density of alpine birds is high where the butterflies are concentrated.

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PAUL HENDRICKS, *Department of Zoology, University of Montana, Missoula, Montana 59812.* Present address: *Department of Zoology, Washington State University, Pullman, Washington 99164-4220.*